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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,937	06/26/2003	Ichirou Miyagawa	Q76019	3417

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EXAMINER

PHAM, HAI CHI

ART UNIT	PAPER NUMBER
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2861

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/14/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/603,937

Applicant(s)

MIYAGAWA, ICHIROU

Examiner

Hai C. Pham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on RCED filed on 12/21/06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-16, 18, 20 and 22-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-16, 18, 20 and 22-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/21/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Request For Continued Examination

1. The request filed on 12/21/06 for a Continued Examination (RCE) under 37 CFR 1.114 based on parent Application No. 10/603,937 is acceptable and a RCE has been established. An action on the RCE follows.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims **11**, **12** and **13** are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims **5**, **7** and **10**,

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respectively, of copending Application No. **10/263,697** (Pub. No. US 2003/0068126) in view of Suzuki et al. (US 6,444,949).

This is a provisional obviousness-type double patenting rejection.

Current application 10/603,937	Copending Application No. 10/263,697
11. An exposure apparatus for forming an image on a recording medium by scanning exposure, the apparatus comprising: a light source for ejecting a light beam emitted in a broad area for <i>at least a main-scanning direction</i> ,	5/4. An exposure device for forming an image on a recording medium via scan-exposure, said device comprising: a light source for emitting light beams in a broad area <i>at least in a sub-scanning direction</i> for forming the image;
a condensing optical system for condensing the light beam emitted from the light source on the recording medium,	a condensing optical system for condensing the light beams emitted from the light source onto the recording medium;
an array refracting element which is disposed between the light source and the recording medium so that a direction, is substantially parallel to the broad area direction of the light beam emitted from the light source,	an array refracting element disposed between the light source and the recording medium so that a direction in which the light beams are divided is substantially parallel to a broad area direction of the light beams emitted from the light source,
wherein the array refracting element	the array refracting element comprising at

<p>includes a refracting member having a unit surface shape dividing one light beam into two light beams by ejecting the one incident light beam toward different positions.</p>	<p>least two refracting members abutting each other and disposed in an array, wherein each of the at least two refracting members has a surface shape that divides a portion of the light beam incident on the refracting member into two separate light beams, thereby <i>resulting in at least four light beams</i>, wherein the surface shape of each of the at least two refracting members divides the incident light beam into two separate light beams mutually different angular directions and emits the divided light beams.</p>
<p>12. wherein the array refracting element is disposed at a position at which a far field pattern of the light beam emitted from the light source is formed.</p>	<p>7. wherein the array refracting element is disposed at a position where a far field pattern of the light beam emitted from the light source is formed.</p>
<p>13. <i>an inputting component</i> for inputting resolution information showing resolution of an image formed on the recording medium by the scanning exposure; and a</p>	<p>10. <i>an input section</i> into which resolution information indicating a resolution of an image to be formed on the recording medium via scan-exposure is inputted;</p>

<i>moving component</i> in which the array refracting element is removed from the optical axis of the light beam emitted from the light source when the resolution shown by the resolution information is a predetermined first resolution, and the array refracting element is moved so as to be placed on the optical axis when the resolution shown by the resolution information is a second resolution which is lower than the first resolution.	and a <i>conveyor for moving</i> the array refracting element so that the array refracting element is removed from an optical axis of the laser beams emitted from the light source when the resolution indicated by the resolution information is a predetermined first resolution, and the array refracting element is positioned on the optical axis when the resolution indicated by the resolution information is a second resolution that is lower than the first resolution.
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Claim 5 of the copending Application No. 10/263,697 teaches “a light source for emitting light beams in a broad area *at least* in a sub-scanning direction”, meaning that the light source also emits light beams in a broad area in the main scanning direction.

However, Claim 5 of the copending Application No. 10/263,697 fails to explicitly teach that *each* of the at least two refracting members being configured as *a pair* and being arranged in an array shape in a direction orthogonal to a light beam dividing direction.

Suzuki et al. teaches in Fig. 4 an array refracting element (shift member 61) comprising more than two pairs of adjacent refracting members or plates (61a and 61b)

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to be placed side by side in an array, each pair of refracting members dividing the incident light beam emitted from the laser light into two light beams directed towards two different positions (e.g., separated by a distance ΔY) (col. 5, lines 32-57) (col. 7, lines 11-22). Suzuki et al. further teaches that the pairs of refracting plates (61a and 61b) are integrally formed as one unit having a unit surface shape with each pair of adjacent refracting plates dividing the incident light beam into two light beams and that the more than two pairs of refracting plates are arranged in an array shape in a direction orthogonal to a light beam dividing direction (col. 7, lines 38-40).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to configure the at least two refracting members as claimed in claim 5 of the copending Application No. 10/263,697 as pairs of refracting members and to be arranged in an array shape in a direction orthogonal to a light beam dividing direction as taught by Suzuki et al. since it is evident that the refracting member has to be configured as two separate members having particular/different configurations either in their thickness or their inclination in order to divide the incident light beam into two light beams directed towards two different positions as suggested by Suzuki et al.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 11-13, 18, 20 and 22-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyagawa (U.S. 6,380,966) in view of Suzuki et al. (US 6,444,949).

Miyagawa discloses an exposure recording device comprising a light source (LD, Fig. 12) for ejecting a light beam emitted in a broad area for at least a main-scanning direction, a condensing optical system (42) for condensing the light beam emitted from the light source on the recording medium (F), an array refracting element, which includes a refracting member (64, Figs. 12-13) having a unit surface shape for dividing one light beam (L) into two light beams (L1 and L2) by ejecting the one incident light beam toward different positions (on the recording film F), wherein the array refracting element is configured to arrange the two refracting members in pair unit in an array shape for dividing the incident light beam into two light beams (the prism 64 having a pair of exit surfaces 66a and 66b slanted in the auxiliary scanning direction indicated by the arrow Y).

Miyagawa fails to teach the refracting members being arranged in at least two pair units in an array shape in a direction orthogonal to the light beam dividing direction.

Suzuki et al. teaches in Fig. 4 an array refracting element (shift member 61) arranged parallel to the broad area direction of the light beam emitted from the laser light source, the array refracting element comprising more than two pairs of adjacent refracting members or plates (61a and 61b) to be placed side by side in an array, each pair of refracting members dividing the incident light beam emitted from the laser light into two light beams directed towards two different positions (e.g., separated by a

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distance ΔY) (col. 5, lines 32-57) (col. 7, lines 11-22). Suzuki et al. further teaches that the pairs of refracting plates (61a and 61b) are integrally formed as one unit having a unit surface shape with each pair of adjacent refracting plates dividing the incident light beam into two light beams and that the more than two pairs of refracting plates are arranged in an array shape in a direction orthogonal to a light beam dividing direction (col. 7, lines 38-40).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Miyagawa to include at least two or more pairs of refracting members to be arranged in an array shape in a direction orthogonal to a light beam dividing direction as taught by Suzuki et al.. The motivation for doing so would have been to split the incident light beam into plural light beams forming a higher printing resolution.

Miyagawa, in view of Suzuki et al., further teaches:

- the array refracting element (prism 64) is disposed at a position at which a far field pattern of the light beam emitted from the light source is formed (the prism 64 being disposed closed to the recording medium F) (Fig. 12),
- an inputting component for inputting resolution information showing resolution of an image formed on the recording medium by the scanning exposure (the resolution data being inputted into the control circuit 49) (Fig. 4), and a moving component in which the array refracting element is removed from the optical axis of the light beam emitted from the light source when the resolution shown by the resolution information is a predetermined first resolution (resolution $S = 2.K0$ dpi),

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and the array refracting element is moved so as to be placed on the optical axis when the resolution shown by the resolution information is a second resolution (resolution $S = K0$ dpi), which is lower than the first resolution (the prism being moved in and out of the path of the optical axis of the light beam for changing the resolution) (Fig. 12),

- two refracting members (66a, 66b) in pair unit that divides the same incident light beam being split in two directions (Fig. 13),
- the resolution (2-KO dpi) would be conformed to the claimed relationship (Fig. 16),
- dividing the incident light beam into two light beams requires a same recording information in the two divided light beams (the split laser beams L1 and L2 carry the same image information as that of the incident laser beam L),
- dividing the incident light beam into two light beams requires a same spectrum in the two divided light beams as the incident light beam (the light emission frequency spectrum of the refracted laser beams L1 and L2 remains the same as that of the incident laser beam L),
- the incident light beam is divided at only two different angles by the respective pairs of refracting members (Fig. 13),
- the incident light beam passes through one refracting member of the respective pairs of refracting members unchanged, and is refracted by another refracting member of the respective pairs of refracting members (Figs. 12-13),

- when the light beams divided by the respective pairs of refracting members are condensed, the resultant condensed beam is divided into two beams forming two condensing spots, even when plural pairs of the refracting members are arranged (Fig. 12).

6. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyagawa in view of Suzuki et al. and Fujita et al. (U.S. 6,108,283).

Miyagawa, in view of Suzuki et al. (please refer to paragraph 5 above for the rejection of the similar claimed limitations), discloses all the basic limitations of the claimed invention including a multiple exposure head (82) (Miyagawa, Fig. 15) comprising a plurality of exposure units (84a-84g), but except for the two refracting members having at least one of which is formed as a diffracting member.

Fujita et al. discloses in Figs. 25A-B an array refracting element (light beam dividing element 71) comprising a refracting member (64, Fig. 13) having a unit surface shape for dividing one light beam into two light beams (Fig. 25B) by ejecting the one incident light beam toward different positions (in the y-direction), wherein the array refracting element is configured to arrange the two refracting members (72 and 73) in pair unit in an array shape in a direction orthogonal to a light beam dividing direction (light beam dividing element 71 having two refracting members consisting of the transparent flat plate 72 and the wedge-shaped element 73 arranged in the x-direction orthogonal to light beam dividing y-direction). Fujita et al. further teaches in Fig. 5 the light beam dividing element (34) having a diffraction grating area (34a) and a

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transparent flat area (34b) for dividing the incident beam into substantial parts having the same size and shape.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a diffraction grating portion in the light beam dividing member of Miyagawa as taught by Fujita et al. The motivation for doing so would have been to obtain divided light beams of the same size and shape as suggested by Fujita et al.

Pertinent Prior Art

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Uno et al. (US 6,043,869) discloses a prism array unit comprising more than two pairs of refracting members for dividing one incident light beam into two light beams directed towards to different positions.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on (571) 272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



HAI PHAM
PRIMARY EXAMINER

February 9, 2007